

particles can be accumulated at particular regions of the electrode surface, by either patterning of the electrode or by illumination patterning. This is described in the Summary of the Invention, page 9, lines 5-11, as follows:

Sets of colloidal particles may be captured, and arrays may be formed in designated areas on the electrode surface (Figs. 1a, 1b and Figs. 2a-d). Particles, and the arrays they form in response to the applied field, may be channeled along conduits of any configuration that are either embedded in the Si/SiO<sub>x</sub> interface by oxide patterning or delineated by an external pattern of illumination. This channeling (Figs. 1c, 1d, 1e, Figs. 3c, 3d), in a direction normal to that of the applied electric field, relies on lateral gradients in the impedance of the EIS structure and hence in the field-induced current.

However, the particles are not electrophoretically (or otherwise permanently) deposited on the electrode surface. *See, e.g.,* page 29, lines 6-8: "[T]his method take advantage of the fact that, in contrast to all prior art methods, the array represents a temporary configuration of particles that is maintained by the applied electric field and may be rearranged or disassembled at will."

As the Examiner notes, Mitchell et al. is directed to electrophoretically depositing diamond particles on a semiconductor substrate. In Mitchell et al., two electrodes are oppositely charged, and an electrolyte is between the electrodes, and: "Diamond particles suspended in a liquid electrolyte are subjected to a directional field and caused to migrate and deposit on a substrate in contact with a selected electrode." *See* Mitchell et al., "Statement of the Invention." Accordingly, the electrophoretic deposition takes place when the particles are attracted to the electrode surface; *i.e.*, the particles move from the liquid electrolyte normal (perpendicular) to the surface and deposit on the electrode surface. In contrast, claim 55 (as amended) reads as follows (in pertinent part): "at least one of said first and second electrodes is physically or chemically patterned to distribute an electric field in a predetermined manner in order to control the movement of the particles and/or the liquid medium **in a direction parallel to the electrode surface** when an electric field is generated within said interface." (emphasis added). There clearly is no disclosure or suggestion in Mitchell et al. of controlling the movement of particles in a direction parallel to the electrode surface, using either light on a light-sensitive electrode, or chemical or physical patterning.

Regarding claim 54, it requires: "at least one of said first and second electrodes comprises a light-sensitive electrode capable of controlling the movement of the particles and/or the fluid medium **in a direction parallel to the electrode surface** when an electric field is generated within said interface and the light-sensitive electrode is illuminated with a predetermined light pattern." There clearly is no disclosure or suggestion in Mitchell et al. of controlling the movement of particles in this manner, in particular, when using illumination with a predetermined light pattern.

The Examiner states in the Office Action, paragraph 7, that:

the silicon electrode [of Mitchell et al.] inherently possesses the property of a light-sensitive electrode as claimed. The difference between the reference and the above claims is the manner of operating the device.

It is noted that again that the difference between Mitchell et al.'s device and that claimed is not "the manner of operating the device," but the fact that there is no disclosure or suggestion in Mitchell et al. of the following claim element: an electrode which is "capable of controlling the movement of the particles and/or the fluid medium **in a direction parallel to the electrode surface** when an electric field is generated within said interface and the light-sensitive electrode is illuminated with a predetermined light pattern." (see claim 55).

Regarding the cases cited by the Examiner to support the assertion that "the manner in which an apparatus operates is not germane to the issue of patentability of the apparatus itself," the Examiner has cited *Ex Parte Wikdahl*, 10 USPQ2d 1546; *Ex Parte McCullough*, 7 USPQ2d 1889; *In re Finterswalder*, 168 USPQ 530 (1971); *In re Casey*, 152 USPQ 235 (1967). First, it is noted that the "manner in which the apparatus operates" is not recited in the independent claims 54 and 55. There is, instead, a number of elements recited, including the ones noted (in bold) in the immediately preceding paragraph. This distinguishes the nonobviousness of the claimed subject matter here from the situations presented in the cases cited by the Examiner.

In *Ex Parte McCullough*, 7 USPQ2d 1889, 1891 (1987), the Board reasoned as follows:

[W]e find that the claim defines an electrode which "comprises" a carbonaceous material having the characteristics or properties set forth in the claim. True, the

electrode is intended for use as the positive and/or negative plate of a non-aqueous battery and, when used in a battery, the carbonaceous material is intended for use "as the active energy storing component". But appellants are not claiming a battery or a method of using an electrode in a battery. As correctly found by the examiner, appealed claim 1 defines an electrode *per se*. The manner in which such electrode will function when used in a non-aqueous battery is, in our view, not germane to the issue of patentability of the electrode itself.

As support for its position above, the Board cited *In re Casey*, 152 USPQ 235, 238 (CCPA 1967) (also cited by the Examiner) as follows: "[t]he claims in issue call for an apparatus or machine, viz. a tape dispensing machine. The manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself." Similarly, in *Ex parte Wikdahl*, 10 USPQ2d 1546, 1548 (1989), the Board found the structure set forth in the claims to be present in the primary reference (Gustavsson) and noted that:

The preamble of claim 1 recites that the cyclone separator is 'for separating material including fibers suspended in a liquid suspension into a light fraction containing the fibers and a heavy fraction containing rejects.' However, the manner or method in which a machine is to be utilized is normally not germane to the issue of patentability (especially where, as here, appellant's structure, even in view of the claim language, differs in no way from the structure of Gustavsson).

Similarly, again, in *In re Finsterwalder*, 168 USPQ 530, 534 (CCPA 1971) the Court noted:

Prior to analyzing the significance of these limitations, it must be emphasized that appellant is *not* claiming here any particular *method* of construction, but rather he claims *apparatus* which may be used in any method of construction to which it is reasonably adaptable. Thus, the fact that appellant discloses the apparatus as advantageous in the "free cantilever" method of construction will not save the claims if the apparatus defined thereby would have been obvious to a person of ordinary skill in the bridge-construction art intending to use it in a somewhat different construction method.

Thus, in all the decisions cited by the Examiner, the common feature is that the claimed elements were apparatus, and the arguments made to attempt to establish patentability related to the operation of the apparatus. This is not the case here, as the features asserted as establishing patentability are set forth clearly in the claims. In conclusion, all

rejections have been addressed and overcome, and Applicant respectfully requests allowance.

Respectfully

Submitted,

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